

# The Role of Media Technology and the Concept of Traffic Safety for Youth

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## Abstract

Saudi Arabia is considered one of the best developed countries in the world in terms of the availability of highways networks, and also having one of the highest world rates of car accidents. The crazy speed in driving is the main cause of these accidents, and most categories of these drivers are teenagers or below the age of twenty five. The World Health Organization classified Saudi Arabia as the top world record in the rate of deaths due to traffic accidents, recording more than 49 deaths per 100 thousand inhabitants. It is known that increasing the average speed rate one kilometer per hour leads to an increased risk of accident and injury rate of three percent, with an increase between four and five percent of accidents that cause deaths. Considering the human side of the problem, and tracking the growing up of our young people from childhood to adult phase using games and computerized media technology, in the form of (Games) and (Simulation) programs, driving strong impressive race cars in a (Virtual) world, we detect more negative than positive aspects, as they do not bear any real consequences in the case of error or preventing road safety (of driver, road or vehicle). It should be noted that the definition of traffic safety is the prevention of road accidents as a regulatory action directed to prevent the dangers of the road in addition to ensure safety in its broadest sense for the users of the road (driver, passengers and pedestrian), therefore there is no way to stop the causes of these accidents and the threat of traffic safety on the roads generally, without searching the roots of the real problem of Saudi youth and its transfer from childhood to adult phase, and from the virtual world to the real world. That is what we aim in this research especially that the impact of media technology is now in every home and in every hand; its negative impact is growing due to the appearance of modern more sophisticated generations. This research deals with several concepts, such as the concept of media technology, simulation programs, methods, means and concepts of traffic safety, as well as stating of policies that achieve that safety on the ground. After review and analysis of the aspects of these policies, we can, thanks to God Almighty, reach a number of results to demonstrate the positive role of media technology in confirming the concepts of traffic safety among young people in the Kingdom, followed by a number of recommendations, and finally the conclusion.

**Keywords:** Media Technologies; Simulation Programs; Traffic Safety

## 1. INTRODUCTION

The problem of road traffic safety is one of the most significant problems facing world countries at all levels

currently, especially after the large increase in the number of population and vehicles, as well as the desire of many to move among and within cities or outside [1, 2]. Unfortunately, although this problem affects all segments of society, the issue of road safety has not yet received sufficient attention at the international and national levels. The number of people who have died as a result of road traffic injuries worldwide is estimated at 1.26 million people in 2010, road traffic injuries accounted for 2.2% of the world's deaths and 25% of all deaths from injuries [3]. At the global level, these are the leading cause of death for people Aged between 25 and 35 years.

At the national level we found that the circumstances that called for serious thinking of establishing a traffic system in Saudi Arabia was in 1925, which is the same year that recorded the arrival of the first car to Kingdom of Saudi Arabia (KSA), followed by issuing the first law for organizing road traffic by the Directorate of Public Security, and was called (Car law).

One of the traffic studies conducted by the National Committee for Traffic Safety confirms the statistics of accidents in the Kingdom in 2004, with a large number of more than 261872 accidents, of which 30439 injuries, ranging between light and serious injuries and 4293 deaths with 12% higher compared to the previous year rate, without doubt, if we do not put an end to this issue the rate is going to be higher than previous years. It is true that the Kingdom has recorded remarkable population growth and a doubling in the number of registered vehicles. However, the losses resulting from these accidents even considering these variables remains above normal limits, Which calls for urgent intervention to find appropriate solutions to mitigate the horrific accidents. The World Health Organization (WHO) has ranked KSA as the world's highest number of road traffic fatalities, has registered more than 49 deaths per 100,000 population. Saudi Arabia recorded a 485,000 traffic accident in 2008, compared to 435,000 in 2007, which indicates an increase in the number of accidents instead of a decrease. In 2008, 6548 people were killed as a result of car accidents. Saudi Arabia's road accidents losses in 2008 are estimated at 23 billion riyals, representing 5 percent of Saudi Arabia's gross national product. An average speed increase of 1 km per hour increases the risk of an accident and injury by 3 percent, with more than four percent increase for accidents that cause deaths, and higher speed increases mortality rates, as well as it increases the severity and impact of trauma. And when talking about this matter and study it by listing the reasons, We find that speed factor is still the main reason for the occurrence of these accidents at the rate of one-third, in addition to Violating Traffic Signal that forms in addition to the high speed

represent about (40%) of traffic accidents, and irregularities such as irregular overtaking and irregular turnover constitute more than Fifth of the incidents, and approximately (50%) of road traffic accidents are caused by people of the young.

The technological revolution influenced everything [4-43], even the methods that aim to improve the road safety with technology and artificial intelligence. Today, the use of Artificial Intelligence (AI) algorithms is expansive, particularly in providing solutions to challenging problems including patterns recognition and retrieval of information [19, 32, 36, 44-58], image segmentation [4, 5, 15, 35, 59-63], analysis of medical images [64-68], Learning Management System [69-94], nurse rostering problem [34], Healthcare Monitoring system [18, 95], as well as prediction of river flow [33, 96, 97]. Accordingly, many systems have used the Artificial Intelligence applications in transportation problems mainly in traffic management, traffic safety, public transportation, and urban mobility [98].

## 2. DEFINITION OF TRAFFIC SAFETY

Traffic safety in its broadest sense aims to adopt all plans, programs, traffic regulations and protective measures to limit or prevent traffic accidents, ensuring human safety and property, and safeguarding the security of the country and its human and economic components.

## 3. TRAFFIC SAFETY ELEMENTS:

The pivot of traffic safety is three elements:

1. Human element
2. Vehicle
3. Road

### 3.1 The human element (drivers)

The human element (drivers) is what we focus on in this research. Car drivers are subjected to different effects, whether expected or not. Their behavior and mental status also play a major role in the traffic flow (inattention, indifference, fatigue, nervousness, bad vision, under sedative). The youth group (18-25 years old) is the most vulnerable to traffic accidents, which studies say they are the main cause of youth deaths.

- **Determining the Quality of the Driver According to His Mental Composition**

Many studies confirm the existence of a significant relationship between the psychological composition of the individual personality and the number of accidents that can be caused by this person, whether for himself or others. According to these studies, about 85% of car accidents are caused by people who have been shown to be psychologically unstable.

Unfortunately, these reports show us how the driver making accident but did not explain in one way or another cause of the accident and what are the internal and external psychological effects that caused it.

There is no doubt that prevention is better than treatment and so that we can reduce these accidents and achieve security and peace, we must identify the causes of these incidents to remedy them. Based on this principle, we see that we must examine the mental state of the drivers, and here the traffic scientists divide the drivers into four groups:

### 1. Moderate Driver

This group consists of the majority of drivers who are honest in their behavior and in their assessment of responsibility when dealing with the road and in their work, Adhere to their religion orders in behavior and dealing with others, but some of these groups suffer temporary psychological discomforts often cause them to ensue in traffic accidents, These disorders soon disappear after the disappearance of these discomforts and the situation returns to normal.

### 2. The Average Driver who Avoids Accidents and Lacks The Experience

In most societies, this group is composed of a large number of drivers and is characterized by the fact that their driving experience and knowledge of driving systems are enough for them to drive. In fact, this is not enough for them to adapt and acclimate to a developed traffic community as it is happening in all our cities.

### 3. The Driver who Considers that Driving is a Race Over Time

This group represents a small percentage among all the prominent businessmen who are forced to travel long distances and believe that the secret of their success is due to the speed in their work and decisions and keep their dates. This group is often characterized by the madness of speed in their cars in prohibited places and Straying mental, which is sometimes a cause of accidents.

### 4. The Driver is not Moderate or Disturbed Psychologically

In most societies, this group accounts for 10% to 20% of drivers aged between 18 and 25 years old and is characterized by psychological and behavioral instability, which accounts for nearly a third of road traffic deaths.

## 4. COMPUTER AND MODERN TECHNOLOGICAL MEDIA AS A MEANS OF TRAINING (SIMULATIONS)

The ability of computers and technological media to manipulate data and respond to alternative experimental decisions by demonstrating potential outcomes has attracted the attention of educators interested in the development of adult learning through games and simulations. Simulation is one of the most important uses of computers for effective training because it conveys nature to the trainee. And allows him to experiment security and reaches the results through the conduct of various experiments and activities. Using the computer has been widely used simulation method in the areas of education, management, driving, military training and other fields Where the learner is placed in a position similar to the real life situations that he will practice to perform his role in that situation, and be responsible for the decisions taken, but if

the mistake is happened that does not cause any risk. Thus simulation method is used in many areas, including training pilots and learning cars driving.

#### **5. THE IMPORTANCE AND PROFIT OF SIMULATION IN DRIVING SCHOOLS**

1. Simulations save large expenses spent in training through real systems.
2. Simulations control time with great flexibility when training can be controlled by increasing or decreasing it.
3. Simulations are used in the case of scarcity or deliberately postpone the existence of the real system.
4. Simulations are used to reduce the severity of the real system as in the command of aircraft and cars.
5. Simulations enable us to control the conditions of the system and its variables and control, allowing the learner training according to his own vision and without risk due to mistakes.
6. Simulations allow re-training many times to fully master the required work or skills. Time is handled accurately and the work done is all simulated.
7. The possibility of neglecting some positions during training, the system imitator can be stopped and completed later, which is not allowed in real situations.
8. It is noted that simulation programs are not just traditional educational programs that the learner interacts with in controlling the presentation only, but similar to the behavior that the learner will be practicing later on.

#### **6. LEARNING THE BEHAVIORS OF YOUNG PEOPLE THROUGH IMITATION (SIMULATION)**

Play has major role in training through imitation (simulations) and development of the higher functions of mental activity and motivating creativity, Taylor explains, that has a significant role in the growth of cognitive mental activity and important in the growth of higher functions - such as perception, thinking, memory, imagination and exploration and creativity at The child starts from the most basic to the most complex, and thus the child's mind opens up when he plays and grows his creative thinking through his interaction with the games. Most of the attempts at psychology have been to explain how human behavior occurs, and how a person learns to do certain behaviors or acquires a certain skill. However, there is the theory that showed that man learns through simulations or imitating the model. Hence, the importance of models that we can make before the eyes of our children, such as the technological means and electronic games, if we want from them to learn creative thinking or behavior, in addition to Negative or invalid models, which attract our children to gain bad behavior.

#### **7. THE FIELD OF TECHNOLOGICAL MEDIA AND ELECTRONIC GAMES**

Experts in the field of technological media and electronic games have estimated that Saudi children spend about \$ 400 a

year on electronic entertainment games and have confirmed that the Saudi market absorbs nearly 3 million electronic games a year, including 10,000 original games and the rest is tradition. Marketing specialist in an electronic games company says that the Kingdom's markets absorbed about one million and 800 thousand devices (PlayStation), explaining that more than 40% of Saudi homes include at least one device. PlayStation games are no longer exclusive to young people, but have become the obsession of many young people. One of the most prominent phenomena of children's games in the field of technological media, electronic games, which is called (PlayStation), even presented in the propaganda of the producer says: (How will be your life without PlayStation?). One study confirms that children who are passionate about this game get nervous irritations that indicate the incursion of the violence and the severe tension in their parts? It may even come to epilepsy. What do you expect from a child sitting in one corner of the room with his eyes screwed into a small screen flashing a variety of vibrant colors, his hands clinging tightly to a small device shaking their fingers from each device tremor, and they move nervously over Buttons in different colors and sizes, their ears listen carefully to the voices and screams and electronic tracks fade sometimes and rise many times to take over their intention, does not see nor hear or aware of what is around but this device. Says Dr. Alsacefer.

The electronic games like PlayStation can affect the child to become violent, many of the driving games increase the player's score of points as the number of fatalities, the child learns again that killing while driving is acceptable and joy, and the child here participates in violation of all traffic safety laws in addition to murder, beatings, vandalism, and so forth, as a personal training. Thus, these games create a violent child, because of the content of the scenes of violence associated with the child, and remains the manner of his behavior in the face of problems encountered by violence, and research has shown a relationship between the violent behavior of the child and the scenes of violence he sees, Computer games have a great impact on the child's mind. The child may be mentally and socially handicapped if he becomes addicted to computer games and the like. The study found that a child who is accustomed to the rapid pattern in computer technology and games may have a great difficulty in getting used to the normal daily life that where the degree of speed is much lower, which is exposing the child to a different style of behavior and dealing.

#### **8. PROS AND CONS OF THE FIELD OF TECHNOLOGICAL MEDIA AND ELECTRONIC GAMES**

That technological media such as electronic games is a double-edged sword, even though they have negative aspects, they have positives. The social scientists say that if the electronic games have controls that are keen to be implemented under regular licenses and under educational supervision, they will have some advantages, so that the child can spend part of his free time without fear or anxiety. He will play games such as sports, memory games, and creative thinking games. The practice of electronic games at an early

age creates a kind of familiarity between the child and the new techniques so that children can deal with them and use them. It also helps learning and doing more than one task at the same time as these games stimulate concentration and attention and activating intelligence, there is a large section of technological media and electronic games dedicated to the development of intelligence capabilities of young people because they need to focus high.

**9. METHODOLOGY**

In this study, the researchers used the analytical descriptive method, which is based on describing the phenomenon studied by collecting facts and information, then comparing, analyzing and interpreting them to reach the desired results. For the purpose of using the descriptive approach, the researchers designed the questionnaire, which consists of two papers (as shown in figure 1), which targets the Saudi citizen from the age of 18 to 25 years. The study tool was subjected to the procedures to measure validity and reliability. Where the researchers presented the tool to a group of traffic experts and academic experts associated with it, in order to express

their views on the content and suitability of what it is intended to measure.

• **The Study Sample**

The researcher identified the sample of the study as the Saudi citizens from age 18 to 25 years. Previously, the researchers interviewed each study group. The researchers saw the need to hold this meeting before the questionnaire to facilitate filling the questionnaire papers.

**10. RESEARCH RESULTS**

• **Results of the Field Study**

The researcher prepared 125 questionnaire copy, filled out 103 copy, 22 incomplete forms were also excluded. After completing the questionnaire by the sample of the study and after counting the most frequent factor (MODE) (MEDIAN) for the sample, we present here the results of the study as in tables 1, 2, 3 and 4, which show the percentages of the answer (yes) or (no) about the five driving behaviors by the (SPSS) program.

The figure displays two pages of a questionnaire in Arabic. The left page contains two sections of questions: 'ثانياً - بخصوص حوادث القيادة' (Secondly - regarding driving accidents) and 'رابعاً : بخصوص ألعاب الفيديو' (Fourthly: regarding video games). The right page contains 'أولاً : بخصوص سلوكيات القيادة' (Firstly: regarding driving behaviors) and 'ثالثاً : بخصوص مسابقات القيادة' (Thirdly: regarding driving competitions). Each question is followed by 'نعم' (Yes) and 'لا' (No) options with diamond-shaped checkboxes.

Figure 1: Questioner study

### First: Driving Behaviors

Regarding to the first question (do you usually follow traffic instructions and regulations while driving?)

Through the result of the question which is shown table (1), there is a consensus between all participants in the answer (yes) by (100%), which reflects the citizen's awareness of the importance and necessity of following the traffic instructions and regulations while driving.

Regarding to the second question (did you gain driving skills from one of the driving schools?) Through the result of the question which is shown in table 1, we find that there are statistical indications of a convergence of opinion and agreement on the answer yes (77%), and the answer no formed (23%). Reflecting the importance of having schools to teach driving and the awareness of the importance of the skills and knowledge gained through these schools.

Regarding to the third question (did you gain driving skills from driving simulation games?) Through the result of the question which is shown in table (1), we find that there are also indications that there is a high percentage answered with yes (46%), reflecting the presence of a large segment of the sample of the study, which has already been heavily influenced by the driving simulation games.

Regarding to the fourth question (Are simulated games sufficient training for the real driving?) Through the result of the question which is shown in table (1), we find: There are indications that there is a convergence between participants in the answer (yes) by 33% and (NO) by 67%, reflecting the citizen's awareness of the insufficiency of simulated games to train the real driving of cars, and the need to adhere to the correct and realistic methods of learning.

Regarding to the fifth question (do you think that the wrong behaviors because of the driving of others?) Through the result of the question which is shown in table (1) we find that: There are also statistical indications of a convergence of opinion and agreement on the answer (yes) 100%, Reflecting the citizen's awareness of the importance and necessity of adhering to traffic instructions and decent behavior during driving.

**Table 1:** The result of the questionnaire regarding to the driving behavior questions

First Field	Number	Question	Yes %
Regarding to driving behavior	1	Do you usually follow traffic instructions and regulations while driving?	100%
	2	Did you gain driving skills from one of the driving schools?	77%
	3	Did you gain driving skill from driving simulation games?	46%
	4	Are simulated games a sufficient training for the real driving?	33%
	5	Do you think that the wrong behaviors because of the driving of others?	100%

### Second: Driving Violations

Regarding to the first question (Is the violator in your opinion a natural person?) Through the result of the question which is

shown in table (2) we find that: There are statistical indications confirm the existence of unanimity of all participants in the answer (yes) by (100%), the citizen's awareness of the importance and necessity of the obligation not to violate traffic regulations while driving.

Regarding to the second question (do you usually commit not to do violations while driving?)

There is also statistical evidence that there is a convergence of opinion and agreement on the answer (yes) by (100%), which reflects the citizen's awareness of the importance and necessity of commitment not to violate the traffic regulations while driving.

Regarding to the third question (Is the high speed a driving requirement?) Through the result of the question which is shown in table (2) we find that: There are also indications that the convergence of the answer (yes) by (18%), and the answer No by (82%), reflecting the conviction of the majority of the sample of the study by the importance of adherence to speed limits for each type of road while driving.

Regarding to the fourth question (is it different in emergency situations and the disruption of roads?) Through the result of the question which is shown in table (2) we find that: There are indications say there is a convergence between participants in the answer (yes) by 22% the answer (no) was 78%, reflecting the citizen's awareness of the danger of violating traffic rules even in cases of emergency.

Regarding to the fifth question (Do you consider that the accidents are due to mistakes of others driving?) Through the result of the question which is shown in table (2) we find that: There are also statistical indications of a convergence of opinion and agreement on the answer (yes) with (100%), Reflecting the citizen's awareness of the importance and necessity of complying with traffic regulations and not committing violations during driving.

**Table 2:** The results of the questionnaire regarding to the driving violations questions.

Second Field	Number	Question	Yes %
Regarding to driving violations	1	Is the violator in your opinion a natural person?	100%
	2	Do you usually commit not to do violations while driving?	100%
	3	Is the high speed a driving requirement?	18%
	4	Is it different in emergency situations and the disruption of roads?	22%
	5	Do you consider that the accidents are due to mistakes of others driving?	100%

### Third: Driving Accidents

Regarding to the first question (Is the accident in your opinion expected to occur during the driving?) Through the result of the question which is shown in table (3) we find that: There are statistical indications confirm the agreement of all participants in the answer (No) with (100%), Reflecting the citizen's awareness of the importance and necessity of adhering to traffic regulations and avoiding accidents while driving.

Regarding to the second question (did you have a car accident which could not be avoided while driving?) Through the result of the question which is shown in table (3) we find that: There are also statistical indications of a convergence of opinion and agreement on the answer (yes) (97%), and the answer (no) by (3%). Reflecting that part of the sample of the study is not qualified in term of training and psychological responses in the time of crisis.

Regarding to the third question (was the first car accident before you obtained the driving license?) Through the result of the question which is shown in table (3) we find that: There are also indications that there is convergence in the answer (yes) by 45% and the answer (no) by (55%), reflecting the presence of a large segment of the study sample that has already been heavily influenced by the technological media of driving simulation games and attempted to apply them practically on the roads before obtaining the official driving license.

Regarding to the fourth question (did you have a car accident after obtaining the driving license?) Through the result of the question which is shown in table (3) we find that: There are indications that there is a convergence between respondents in the answer (yes) by (22%). The answer was (82%) no, which reflects their access to sufficient training before obtaining the driving license.

Regarding to the fifth question (do you consider that car accidents are due to mistake of others driving?) Through the result of the question which is shown in table (3) we find that: There are also statistical indications of a convergence of opinion and agreement on the answer with (100%) yes that reflects the citizen's awareness of the importance and necessity of adhering to traffic instructions and behavior during driving.

**Table 3:** The results of the questionnaire regarding to the driving accidents questions.

Third Field	Number	Question	Yes %
Regarding to driving accidents	1	Is the accident in your opinion expected to occur during the driving?	0%
	2	Did you have a car accident which could not be avoided while driving?)	97%
	3	Was the first car accident before you obtained the driving license?)	45%
	4	Did you have a car accident after obtaining the driving license?)	22%
	5	Do you consider that the car accidents are due to mistakes of others driving?	100%

#### Fourth: Electronic Games

Regarding to the first question (did you feel the importance of your leadership role during playing games?) as in table (4) we find that: There are indications that there is an agreement between the respondents (yes) by (83%), and (17%) no, reflecting the presence of a large segment of the study sample that has already been heavily influenced by the technological media of driving simulation games.

Regarding to the second question (did you play the electronic games for driving?) As shown in table (4) we find that: There

are indications that there is an agreement between respondents (yes) by (100%), Reflecting that the majority of the study sample has already been heavily influenced by technological media such as car driving simulation games.

Regarding to the third question (did you consider the professional movements in these games as driving skills?) from the table 4 we find that high percentage of the study sample answered with yes(73%) reflecting the presence of a large segment of the study sample has already been heavily influenced by the technological media of the driving simulation games

Regarding to the fourth question (did you commit a traffic violation that you believe is the result of the application of some of these movements acquired from driving simulation games?) from the table 4 we find that some of the study sample answered with yes (11%) reflecting the presence of a segment of the study sample has already been influenced by the technological means of the driving simulation games and may have acquired these skills and undesirable movements in driving .

Regarding to the fifth question (have you ever been involved in a car accident as a result of these movement acquired from driving simulation games?) from the table 4 we find that some of the study sample answered with yes (9%) reflecting the presence of a segment of the study sample that has already been acquired these skills and undesirable movements in driving and caused car accidents.

**Table 4:** The results of the questionnaire regarding to the simulation games questions.

Fourth Field	Number	Question	Yes %
Regarding to simulation games	1	Did you feel the importance of your leadership role during playing games?	83%
	2	Did you play the electronic games for driving?	97%
	3	Did you consider the professional movements in these games as driving skills?	73%
	4	Did you commit a traffic violation that you believe is the result of the application of some of these movements acquired from driving simulation games?)	11%
	5	Have you ever been involved in a car accident as a result of these movement acquired from driving simulation games?	9%

## 11. CONCLUSION

Games and driving simulation are considered as the method of spending most of the leisure time during school days and all the time during summer vacations, These games are only simulation programs to lead many dazzling cars, which are usually accompanied by spectacular visual and color effects and noisy musical backgrounds that capture the heart, mind, and eye of the child for more than 13 years. During these years, negative behaviors, skills, and convictions are formed such as driving opposite direction or intentional collision with walls or other cars, and even the most dangerous which is loss of lives on the road, whether for humans, animals or plants. Of course, because the world of games is a virtual world, there are no laws or punishments, the player continues this feeling

and these convictions for 13 years - and this is confirmed by the results of the questionnaire - and suddenly finds himself driving a real When entering the real world, the young man finds a game that is often dreamed of on a large scale. Although he has tried very hard to convince himself that he is in a real field and not a virtual, he cannot give up a high speed.

Road traffic accidents have become a serious threat to the communities because of the loss of lives and properties, and these losses caused by road accidents have become increasingly dangerous day by day, and reducing it has become a difficult task needs the cooperation of various parties, and making more efforts through awareness campaigns.

Traffic accidents and resulting fatalities and injuries have become the main concern of the society. The World Health Organization (WHO) estimates that the number of those killed is 250,000 people each year, and for each death, 10 to 15 people are injured. Finally, there are recommendations at the organizational level to establish modern driving schools with a contemporary concept. These schools were established by a law approved by the Minister of the Interior on 29/7/1975, then the first school for driving education was opened under the supervision of the General Directorate of Traffic in Jeddah in 1975, followed by the opening of several similar schools throughout the Kingdom. These schools aimed to provide the opportunity to train the drivers and provide them with a large amount of technical and scientific information and regulations related to road traffic safety. These need to be re-evaluated, taking into account preparing youth rehabilitation curricula in the face of the negative effects of modern technological means such as car driving simulation games.

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